

IN THE DRAWINGS

The attached sheets of drawings include changes to Figs. 15-17. These sheets, which include Figs. 14B-17, replace the original sheets including Figs. 14B-17.

Attachment: Replacement Sheets

REMARKS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1 and 3-7 are pending in this application, Claim 2 having been canceled without prejudice or disclaimer, Claims 1 and 3-6 having been presently amended, and Claim 7 having been added. Support for amended Claims 1 and 3-6 can be found, for example, in the original claims, drawings, and specification as originally filed.¹ Applicants respectfully submit that no new matter has been added.

In the outstanding Office Action, the specification and drawings were objected to due to informalities; Claims 1-2 were rejected under 35 U.S.C. § 103(a) as unpatentable over Mizutani et al. (U.S. Patent No. 3,817,710; hereinafter “Mizutani I”); and Claims 3-6 were rejected under 35 U.S.C. § 103(a) as unpatentable over Mizutani I in view of Mizutani et al. (U.S. Patent No. 3,761,677; hereinafter “Mizutani II”).

In response to the objection to the specification, Applicants have amended the specification in accordance with the suggestions set forth in the outstanding Office Action. Accordingly, Applicants respectfully submit that the objection to the specification has been overcome.

In response to the objection to the drawings, Applicants have amended Figures 15-17 to include the legend “Background Art.” Further, Applicants note that radiator 49 is shown in Figures 11-2 and 11-4. Accordingly, Applicants respectfully submit that the objection to the drawings has been overcome.

In response to the rejection of Claims 1-2 under 35 U.S.C. § 103(a) as unpatentable over Mizutani I, Applicants have amended Claim 1 to include the features of Claim 2.

¹ See Original Claim 2 and Figures 3-10.

Applicants respectfully submit that amended independent Claim 1 recites novel features clearly not disclosed or rendered obvious by the applied references.

Amended independent Claim 1 is directed to a single-crystal growth apparatus including, *inter alia*:

...the interfocal distance of the one and other foci is 41.4 – 67.0 mm and the minor axis / major axis ratio of the spheroid mirrors is 0.90 – 0.95, and the major axes of the spheroid mirrors are set to 57.7 – 80 mm, the minor axes to 52 – 76 mm, and the total power of the heat sources to 1,100 – 1,500 W, for a heating performance of 2,000 °C.

Applicants respectfully submit that the cited references fail to disclose or suggest that “the total power of the heat sources to 1,100 – 1,500 W, for a heating performance of 2,000 °C,” as recited in Applicants’ amended independent Claim 1.

An advantageous feature of an embodiment of Applicants’ invention is that even if the electric power of the halogen lamp is designed to be very low, i.e. 650W (below 1 kW), heating performance of at least 2,000 °C can still be reached. In order to reach a temperature of 2,000 °C using a low electric power halogen lamp of 650 W, it is necessary to optimize the spheroid mirrors and the cooling mechanism, taking extremely high efficiency into account. Figures 3-10 of the Applicants’ specification, for example, show the results of optimized mechanisms with the above characteristics.

Page 3 of the outstanding Office Action states that “Mizutani discloses a total power of 1.5 kW, thereby making it possible to achieve heating performance of 2,000 °C.”

However, Mizutani I only describes that when using a halogen lamp of 1.5kW, a polycrystalline rod of Ni-Zn ferrite is heated to 1,650 °C.² Even though typically the higher the electric power halogen lamp used, the higher the temperature that is obtained, Mizutani I does not describe reaching heating performance of 2,000 °C using a heat source of 1,500 W,

² See Mizutani I at column 6, lines 55-64.

and it is pure speculation that the 1.5 kW halogen lamp used in Mizutani I has the characteristics of Applicants' Claim 1. Further, Applicants respectfully submit that the outstanding Office Action provides no evidence to support the implicit assertion that the above-noted element of Claim 1 necessarily flows from the teachings of the applied prior art"³ "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'"⁴

Applicants respectfully submit that the cited references also fail to disclose or suggest that "the interfocal distance of the one and other foci is 41.4 – 67.0 mm and the minor axis / major axis ratio of the spheroid mirrors is 0.90 – 0.95, and the major axes of the spheroid mirrors are set to 57.7 – 80 mm, the minor axes to 52 – 76 mm," as recited in Applicants' amended independent Claim 1.

Page 3 of the outstanding Office Action acknowledges that Mizutani I "does not disclose more than one mirror, an interfocal distance of 41.1 to 67mm, or a major axis of 57.7 to 80 mm and a minor axis of 52 to 76 mm," but states that "it would have been obvious to one of ordinary skill in the art at the time of the invention to include more than one mirror and to modify the distance between the two foci in order to change the heat irradiating the feed rod and seed crystal rod." However, Applicants respectfully submit that it would not

³See MPEP 2112 (emphasis in original) (citation omitted). See also same section stating that "[t]he fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic," (emphasis in original). See also In re Robertson, 49 USPQ2d 1949, 1951 (Fed. Cir. 1999) ("[t]o establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill,'" citing Continental Can Co. v. Monsanto Co., 948 F.2d 1264, 1268, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991); and "[i]nherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient," Id. at 1269 (citation omitted)).

⁴ In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999).

have been obvious for a person of ordinary skill in the art to modify the teachings from this reference so as to arrive at Applicants' claimed inventions. The position that these teachings *could* be modified to arrive at the claimed inventions would be insufficient to establish a *prima facie* case of obviousness.⁵ Furthermore, it is not clear how such modification could be achieved without a substantial reconstruction or redesign of the system disclosed by this reference.⁶ Further, the Supreme Court in *KSR International Co. v. Teleflex Inc.*, stated that the analysis supporting a rejection under 35 U.S.C. 103 should be made explicit. The court quoting *in re Kahn*⁷ stated that "[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness."

In rejecting a claim under 35 U.S.C. § 103(a), the USPTO must support its rejection by "substantial evidence" within the record,⁸ and by "clear and particular" evidence⁹ of a suggestion, teaching, or motivation to combine the teachings of different references. As discussed above, there is no substantial evidence, nor clear and particular evidence, within the record of motivation for modifying the Mizutani I device. Without such motivation and

⁵See MPEP 2143.01 stating that the "fact that references can be combined or modified is not sufficient to establish *prima facie* obviousness."

⁶ See *In re Ratti*, 270 F.2d 810, 813, 123 USPQ 349, 352 (reversing an obviousness rejection where the "suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate.")

⁷ 441 F.3d 977, 988 (Fed. Cir. 2006).

⁸ *In re Gartside*, 203 F3d 1305, 53 USPQ2d 1769 (Fed. Cir. 2000) (holding that, consistent with the Administrative Procedure Act at 5 USC 706(e), the CAFC reviews the Board's decisions based on factfindings, such as 35 U.S.C. § 103(a) rejections, using the 'substantial evidence' standard because these decisions are confined to the factual record compiled by the Board.)

⁹ *In re Dembiczak*, 175 F3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999) ("We have noted that evidence of a suggestion, teaching, or motivation to combine may flow from the prior art references themselves, the knowledge of one of ordinary skill in the art, or, in some cases, from the nature of the problem to be solved, although 'the suggestion more often comes from the teachings of the pertinent references.' The range of sources available, however, does not diminish the requirement for actual evidence. That is, the showing must be clear and particular." (emphasis added)).

absent improper hindsight reconstruction,¹⁰ a person of ordinary skill in the art would not be motivated to perform the proposed modification.

Accordingly, Applicants respectfully submit that independent Claim 1 patentably distinguishes over Mizutani I.

Accordingly, Applicants respectfully request the rejection of Claims 1-2 under 35 U.S.C. § 103(a) as unpatentable over Mizutani be withdrawn.

In response to the rejection of Claims 3-6 were rejected under 35 U.S.C. § 103(a) as unpatentable over Mizutani I in view of Mizutani II, Applicants note that Claims 3-6 are dependent on Claim 1 and are believed to be patentable for at least the reasons discussed above. Further, Applicants respectfully submit that Mizutani II fails to cure any of the above noted deficiencies of Mizutani I.

Accordingly, Applicants respectfully request the rejection of Claims 3-6 were rejected under 35 U.S.C. § 103(a) as unpatentable over Mizutani I in view of Mizutani II be withdrawn.

In order to vary the scope of protection recited in the claims, new Claim 7 is added. New Claim 7 finds non-limiting support in the disclosure as originally filed, for example at original Claim 1.

Therefore, the changes to the claims are not believed to raise a question of new matter.¹¹

¹⁰ See MPEP 2141, stating, as one of the tenets of patent law applying to 35 USC 103, that "[t]he references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention."

¹¹ See MPEP 2163.06 stating that "information contained in any one of the specification, claims or drawings of the application as filed may be added to any other part of the application without introducing new matter."

Consequently, in view of the present amendment, and in light of the above discussion, the pending claims as presented herewith are believed to be in condition for formal allowance, and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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